

# EUROPEAN PATENT OFFICE

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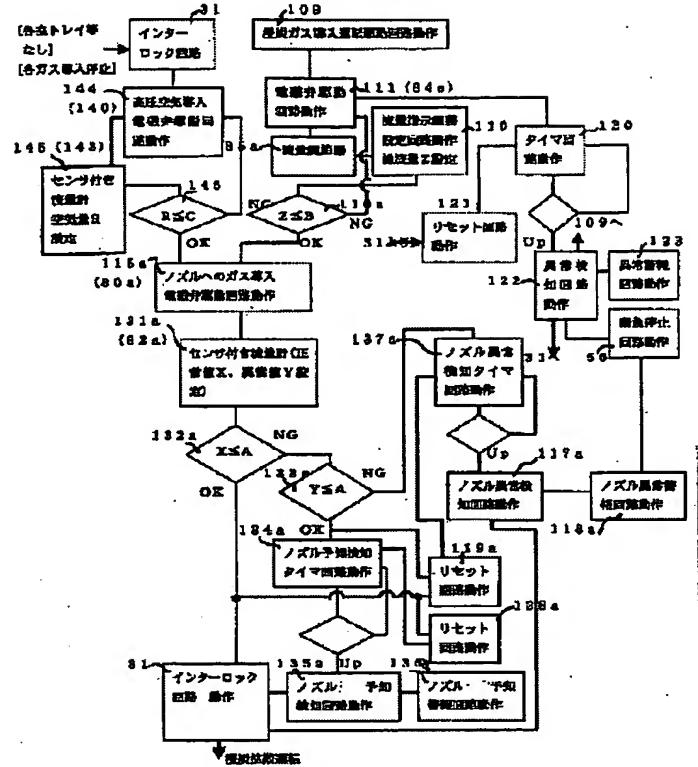
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**TITLE : CLOGGING PREDICTING AND  
DETECTING DEVICE FOR GAS  
NOZZLE OF VACUUM HEAT  
TREATING FURNACE**



**ABSTRACT :** PROBLEM TO BE SOLVED: To provide a clogging predicting alarm outputting device that enables a vacuum heat treating furnace including a continuous vacuum carburizing furnace, a vacuum carburizing furnace, or a vacuum heating furnace to be operated ideally without being stopped for a long period, by predicting the clogging of the nozzles arranged in each chamber of the furnace by automatically detecting the clogged states of the nozzles and outputting a predicting alarm at every nozzle.

**SOLUTION:** This predicting alarm outputting device is provided with monitoring flowmeters 82a-82c with sensors which detect the flow rates of various kinds of gases used for processing set amounts and passing through solenoid-operated valves, which introduce the gases to the nozzles arranged in each chamber of the vacuum heat treating furnace and throttle valves which set the flow rates of the gases. This device is also provided with a nozzle clogging predicting and detecting circuit 136a which detects the clogging of gas nozzles as predicting signals when the flow rates of the gases are lower than the set flow rates of the flowmeters 82a-82c for a fixed period of time, and a nozzle clogging predicting and warning circuit 136a which outputs clogging predicting alarms.

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